

Assignment 3

Title: Connectivity and configuration of Raspberry

Problem Statement: Study of connectivity and configuration of Raspberry Pi/Beagle board circuit with basic peripherals & LEDs. Understanding GPIO and its use in program

Objectives: To understand configuration of Raspberry Pi / Beagle Board circuit with basic peripherals and its use in the program

Outcomes: Student will be able to:
Connect to Raspberry Pi and implement the program

S/W and H/W requirements: Raspberry Pi / Beagle board, Open source Fedora, 8 GB RAM, 500 GB HDD, Keyboard, Mouse, Monitor

Theory: Raspi-config

The Raspberry Pi configuration tool in Raspbian allows you to enable features such as the camera, and change settings like keyboard layout. Arrow keys and Tab can be used to navigate through these menus. Available options-

- Change user password (default is raspberry)
- Network - set hostname, WiFi SSID, pre-shared key, network interface names
- Localization - Set keyboard layout, time zone, locale and WiFi country code (default options related to GB)
- Interfacing options - Enable/disable
 - Camera Interface (CSI)
 - SSH (remote CLI access)

- VNC / RealVNC (virtual computing network server) →
- SPI interface / kernel module automatic loading
- I2C interface / kernel module automatic loading
- Serial - shell and kernel messages on serial connections

LED blinking using Raspberry Pi

- Here, we require 1 LED, 100Ω resistor and jumper cables.
- For GPIO, V_{out} is 3.3V, maximum out current is 16mA/pin.
- For controlling an LED, both Python and GPIO ~~are~~ library are needed.

Python program

- Open terminal
 - Launch IDLE by typing 'sudo idle'
 - Type the code in the new window opened by File > Open
- ```
import time
import Rpi.GPIO as GPIO
GPIO.setMode(GPIO.BOARD)
GPIO.setup(11, GPIO.out)
while True:
 GPI.output(11, True)
 time.sleep(1)
 GPI.output(11, False)
 time.sleep(1)
```
- Save and run the code

### Conclusion

We successfully configurized the Raspberry Pi board and performed the single experiment to blink an LED by making appropriate circuit connections using the GPIO pins.